REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Claim 1 has been amended to include limitations of claim 2 and a part of claim 4 and further limitations as supported by the specification at page 4, lines 2-5 and 11-12, page 5, lines 10-12 and 16-19, page 6, lines 5-7, page 8, lines 12-15, and page 9, lines 9-10, and Fig. 1 in addition to editorial revisions. Accordingly, claims 2 and 4 have been canceled without prejudice.

Claim 11 has been amended to include limitations as supported by the specification at page 9, line 27 – page 10, line 12 and table 3 at page 10 including editorial revisions.

Claims 5-10 and 18 have been canceled without prejudice.

Claims 1-3 and 17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al. (Japanese Patent Publication No. 57-041763) in view of Katayama et al. (Japanese Patent Application Publication No. 2002-001581) and Mori et al. (Japanese Patent Application Publication No. 2002-011593). Applicants respectfully traverse this rejection.

Nakajima discloses an electroconductive paste including rhodium and silver (see coln. 1, lines 21-26). However, the reference fails to disclose a glass article that includes a metal and the electroconductive paste. In the reference, the electroconductive paste is printed at a mounting portion of a metal terminal on a glass plate and dried and then sintered, and the metal terminal is placed on the mounting portion using 20 % Sn – 80 % Pb alloy (see example 1 at coln. 3, lines 29-34 and coln. 4, lines 3-7). Thus, the reference fails to disclose the metal member including the two joining planes, the leg part, and the connection part as claim 1 requires. Consequently, the reference fails to disclose the

properties of the metal member such that the leg part of the metal member briges two joining planes, that the total area of the two joining planes is 40-45 mm^2, that the connection part projects upward from the leg part, and that the rupture of the grass article and the metal member occurs because of a breakage of an inner portion of the glass article near a soldered junction portion and not because of a breakage of the junction portion. Accordingly, claim 1 is distinguished from Nakajima.

Katayama is directed to a flux to be used for a lead-free Sn-Ag based alloy (see abstract). Katayama merely names a 96.5 Sn – 3.5 Ag alloy used for testing the flux, and the reference does not disclose any properties of the alloy other than the name (see para. [0014]). Even if the name of the alloy might suggest contents of Sn and Ag, a liquidus and a solidus temperatures do not always increase when the Ag content increases, and the liquidus and solidus temperatures do not increase or decrease together when the Ag content increases (see table 1 at page 8 of the specification). Accordingly, Katayama also fails to disclose the properties of the lead-free Sn-Ag based solder alloy of the glass article such as the liquidus temperature, the difference of the liquidus and solidus temperatures in addition to the maximum content of other minor component as claim 1 requires. In addition, Katayama doest not disclose the metal member including the leg part, the two joining planes, and the connection part and accordingly, fails to disclose the properties of the metal member including the total area of the two joining planes and the breakage that occurs because of an inner portion of the glass article in a vicinity of a junction portion as claim 1 requires. Thus, Katayama does not remedy the deficiencies of Nakajima.

Mori discloses a lead-free alloy including 2.0-3.0 wt% Ag, 0.1-1.5 wt% Bi, 0.1-1.0 wt% Cu, and the balance Sn (see abstract). Even if Mori disclose that the maximum melting point must be less than 250 °C and preferably, 220 °C (see coln. 7, para. [0033]), Mori does not disclose a liquidus temperature and a solidus temperatures and accordingly, fails to disclose that the difference of the liquidus and solidus temperatures of the alloy must be 10°C or less. Because increase or decrease of the liquidus and solidus temperatures do not always correlate with increase or decrease of Ag content, and the liquidus and solidus temperatures do not increase or decrease together when the Ag

content increases as discussed above, the difference of the liquidus and solidus temperatures may vary depending on conditions. Moreover, like Katayama, Mori fails to disclose the metal member of the glass article including the leg part, the two joining planes, and the connection part and accordingly, the properties of the metal member including the total area of the two joining planes and the breakage as claim 1 requires. Thus, Mori also does not remedy the deficiencies of Nakajima.

Accordingly, claim 1 is distinguished from Nakajima in view of Katayama and Mori, and this rejection should be withdrawn.

Claims 4-11 and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al. (Japanese Patent Publication No. 57-041763) in view of Katayama et al. (Japanese Patent Application Publication No. 2002-001581) and Mori et al. (Japanese Patent Application Publication No. 2002-011593), and further in view of Nakano (Japanese Utility Models Application Publication No. 06-058557) and Uehara et al. (Japanese Utility Models Publication No. 61-037182). Applicants respectfully traverse this rejection.

Claims 4-10 and 18 have been canceled, and a part of the limitations of claim 4 has been included in claim 1. Claim 1 and accordingly, claims 11 are distinguished from Nakajima in view of Katayama and Mori for at least the same reasons as discussed for claim 1 above.

Even if Nakano discloses a metal member that includes a leg part, two joining planes, and a connection part (see Fig. 7), Nakano fails to disclose the total area of the two joining planes of the leg part is 40-45 mm^2 and that the rupture of the grass article and the metal member occurs because of a breakage of an inner portion of the glass article near a soldered junction portion rather than the breakage of the junction portion. Nakano further fails to disclose the properties of the Sn-Ag based alloy such that the difference between the liquidus temperature and the solidus temperature of the alloy is 10°C or less. Accordingly, Nakano does not remedy the deficiencies of Nakajima in view of Katayama and Mori.

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Response to the Office Action dated August 15, 2008

Uehara discloses a comparison of bond strength among three total soldered areas such as 61.5 mm^2 (Fig. 5-A), 65.0 mm^2 (Fig. 5-B), and 82.5 mm^2 (Fig. 5-C), which may correspond to a size of the two joining planes (see, a partial translation of Uehara attached hereto), and Uehara fails to disclose that the total area of the two joining planes is 40-45 mm^2. In addition, Uehara discloses that the adhesion increases while the total area of the adhesion increases among these three (see table 1). However, in the glass articles of claim 1, the decrease of the bond strength by thermal stress can be prevented by controlling the joining area within a predetermined range such as the area of 40-45 mm^2 (see page 4, lines 6-12 of the specification). Thus, Uehara does not remedy the deficiencies of Nakajima in view of Katayama and Mori.

Accordingly, claim 1 and claim 11 are distinguished from of Nakajima in view of Katayama and Mori and further in view of Nakano and Uehara, and this rejection should be withdrawn.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

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Dated: November 14, 2008

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VERIFICATION OF TRANSLATION

U.S. Patent Application No. 10/506,385

Title of the Invention:

GLASS ARTICLE WITH METAL MEMBER JOINED THERETO, AND JUNCTION STRUCTURE USING THE SAME

I, Noriko ISONO, whose full post office address is c/o Seiran International Patent Firm, 8th Fl., Umeda Plaza Bldg. Annex, 4-3-25, Nishitenma, Kita-ku, Osaka-shi, Osaka 530-0047 Japan,

am the translator of the document attached and I state that the following is a true translation to the best of my knowledge and belief of Japanese Utility Model Registration Application No. 56-144634/ Publication No. 61-37182 Y2 (filing date: September 29, 1981/ publication date: April 11, 1983).

At Osaka, Japan

Dated this 20th day of October, 2008

磯野典子

Noriko ISONO

Partial Translation of JP 61(1986)-037182 Y2

JUNCTION STRUCTURE OF TERMINAL

[Table 1]

Degree of solder spread / Tensile force (kg)	A	B	C
40-45		1	2
35-39		1	1
30-34		6	
25-29	1	23	4

Degree of solder spread / Tensile force (kg)	A	B	C
20-24	17	21	
15-19	11		
10-14	2		
10 kg or less			

[Page 3, lines 21 to 35 of lower left column]

Table 1 shows the results of the tensile test that was conducted using conventional terminals each in which the undersurface of the seat portion is not flush with the undersurface of the body part connected to the seat portion. In the table, "A" shows a case where the solder had not reached the undersurface of the folded portion, as shown in Fig. 5A (the total junction area: 61.5 mm^2), "B" shows a case where the solder had spread over the undersurface of the folded portion but the amount of the solder that had spread over the undersurface of the folded portion is small, as shown in Fig.

5B (the total junction area: 65.0 mm^2), and "C" shows a case where the solder had spread sufficiently over the undersurface of the folded portion, as shown in Fig. 5C (the total junction area: 82.5 mm^2). As is clear from Table 1, most of the terminals having a junction structure in which the solder had not reached the undersurface of the folded portion came off by a tensile force of 25 kg or less. In the cases of B and C, the terminals also could not bear a tensile force of 45 kg or more. Thus, the conventional terminals were weak in adhesion strength in any cases.